LEBEDEV, Aleksey Mikhaylovich, dotsent; FAYTEL'BERG, A.G., redaktor; ANAN'IN, B.I., redaktor izdatel'stva; TIKHONOVA, Ye.A., tekhnicheskiy redaktor

[Ways of prolonging the life of hulls of seagoing vessels; decks and platforms] Puti uvelicheniia sroka sluzhby korpusov morskikh sudov; paluby i platformy. Moskva, Izd-vo "Morskoi transport," 1956. 229 p. (MLRA 9:8)
(Merchant ships--Maintenance and repair)

LEBEDEV, A.N., red.; SMOLOV, V.B., red.

[Manual on a course project design of computers (for students of the Leningrad Electrical Engineering Institute)] Posobie k kursovomu proektirovaniiu schetno-reshaiushchikh ustroistv (dlia studentov LETI). Leningrad. No.6. 1963. 72 p. (MIRA 18:4)

1. Leningrad. Elektrotekhnicheskiy institut. Kafedra schetno-reshaiushchey tekhniki.

Lebedev, A. N.

AID P - 2129

Subject : USSR/Engineering

Card 1/1 Pub. 35 - 18/20

Author : Lebedev, A. N.

Title : Filling in spaces around conduits by section (From foreign technical experience)

Periodical: Gidr. stroi., no.3, 46-47, 1955

Abstract : The article discusses the concreting of penstocks at a Canadian power plant and gives details on sectional filling-in of spaces between the penstock and the rock in order to decrease the pressure on the penstock. One English reference.

Institution: None

Submitted : No date

AID P - 3213

Subject : USSR/Hydraulic Engineering

Card 1/1 Pub. 35 - 17/19

Author : Lebedev, A. N.

Title : Automatic reinforced concrete tainter gates

Periodical : Gidr. stroi., 5, 45, 1955

Abstract : The article is a digest of an article in Bautechnik, Ja 1954, No. 1, which deals with the operation of reinforced concrete taintor gates installed in the Argentine. One diagram.

Institution : None

Submitted : No date

KRIVSKIY, M.N., inzhener; SAFRONOV, A.I., inzhener; LEBEDEV, A.N.

Some scraper models. Gidr.stroi. 24 no.5:43-45 '55. (MLRA 9:5)
(Scrapers)

LEBEDEV, A.N., kandidat tekhnicheskikh nauk; LEVIN, N.F., redaktor; MATNIKOVA, A.P., redaktor; SABITOV, A., tekhnicheskiy redaktor

[Mine shaft supports in the Karaganda basin] Podderzhanie gornykh vyrabotok na shakhtakh karagandinskogo bassenina. Moskva, Ugletekhizdat, 1954. 85 p. (MLRA 8:6)
(Karaganda Basin--Mine timbering)

LEBEDEV, A.N. (Leningrad)

I.I.Grekov; on the 25th anniversary of his death. Sov.med. 23 no.6:134-141 Je '59. (MIRA 12:9)
(SURGEONS)

LEBEDEV, A.N.

Twenty-fifth anniversary of the death of Ivan Ivanovich Grekov. Vest. khir. 82 no.6:156-158 Je '59. (MIRA 12:8)
(GREKOV, IVAN IVANOVICH, 1867-1934)

LEBEDEV, A.N. (Moskva)

Pathology of the anterior choroidal artery in tumors of the brain. Vop.neirokhir. no.2:16-24 '62. (MIRA 15:3)

1. Nauchno-issledovatel'skiy ordena Trudovogo Krasnogo Znameni institut neyrokhirurgii imeni akad. N.N. Burdenko AMN SSSR.
(BRAIN--TUMORS) (CHOROID--BLOOD SUPPLY)
(ANGIOGRAPHY)

L 41340-65 EWG(j)/EWT(m)
ACCESSION NR: AP3001066

S/0205/63/003/003/0408/0414

AUTHOR: Lebedev, A. N.

TITLE: Participation of the midbrain roof and subthalamus in the early bioelectric reaction of the cerebral cortex in rabbits exposed to whole-body ionizing radiation

SOURCE: Radiobiologiya, v. 3, no. 3, 1963, 408-414

TOPIC TAGS: ion radiation, radiation effect, cerebral cortex, cortical radiation reaction, cortex bioelectric activity, subthalamus, midbrain reticular formation, photic stimulation reactivity

ABSTRACT: A study was conducted to clarify the participation of the subthalamus and midbrain roof in radiogenic disturbances of the functional state of the cerebral cortex. Using a diathermy probe, unilateral surgical injury was inflicted on the subthalamus of 7 male rabbits and on the midbrain reticular formation of 5 more rabbits. These 12 experimental animals, together with 6 uninjured controls, were irradiated 5 to 12 days later with a single 1-kr x-ray dose (180 kv, 56 ma; distance, 50 cm; filters, 0.5 mm Cu and 1.0 mm Al). Bioelectric activity of the cerebral cortex and reactivity to a flashing light of increasing brightness were examined by EEG curves. A definite similarity in the reaction to photic

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L 41340-65
ACCESSION NR: AF3001066

stimulation in the rabbits with injury to the subthalamus and those with injury to the midbrain reticular formation was observed, indicationg that the roles of these two structures in determining cortical reaction to radiation are parallel. Most nerve paths leading from the reticular formation to the cortex pass through the subthalamus, which is known to have some part in regulating the activity of the reticular formation. To what degree the subthalamus affects the activity of the reticular formation immediately after irradiation is not clear. Injury to either the subthalamus or the reticular formation does inhibit the development of the normal early bioelectric reaction of the cortex. The blocking effect is more pronounced on the side where the surgical intervention took place. It is concluded that these two structures must be intact in order for the normal early reaction of the brain to radiation to appear. Orig. art. has 3 figures and 2 tables.

ASSOCIATION: Institut vysshey nervnoy deyatel'nosti i neyrofiziologii AN SSSR, Moscow (Institute of Higher Nervous Activity and Neurophysiology, AN SSSR)

SUBMITTED: 29Jun62 ENCL 00 SUB CODE: PH

OTHER: 005

LEBEDEV, A.N.

Role of the optic thalamus in the early reaction of the cerebral cortex to total-body ionizing irradiation of the rabbit. Radiobiologiia 3 no.5:721-722 '63. (MIRA 17:4)

1. Institut vysshey nervnoy deyatel'nosti i neyrofiziologii AN SSSR, Moskva.

LEBEDEV, A.N.

Venography in tumors of the subcortical ganglia. Zhur. nevr. i psikh. 63 no.2:181-186 '63 (MIRA 16:11)

1. Rentgeno-radiologicheskoye otdeleniya (zav. - prof. M.B. Kopylov) Nauchno-issledovatel'skogo instituta neyrokhirurgii imeni N.N.Burdenko (dir. - prof. B.G. Yegorow) AMN SSSR, Moskva.

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LEBEDEV, A.N.

Pneumographic data on tumors of the thalamus opticus and nuclei of the striated body. Vop. neirokhir. no.1:35-40 '65.
(MIRA 18:10)

1. Nauchno-issledovatel'skiy ordena Trudovogo Krasnogo Znameni institut neyrokhirurgii imeni N.N. Burdenko (direktor - prof. A.I. Arutyunov) AMN SSSR, Moskva.

BEREZIN, Anatoliy Sergeyevich; LEBEDEV, A.N., otv. red.; IGNAT'YEV, I.P., red. izd-va; PARNIKOV, Ye.S., tekhn. red.

[Contribution of innovators of an economic council to the seven-year plan]Ratsionalizatory sovnarkhoza - v fond semiletki. IAkutsk, IAkutskoe knizhnoe izd-vo, 1959. 30 p. (MIRA 16:2)

1. Nachal'nik otdela glavnogo mekhanika i energetika, sekretar' pervichnoy partiynoy organizatsii sovnarkhoza (for Lebedev).
(Yakutia--Technological innovations)

LEBEDEV, A.N.

Category : USSR/Nuclear Physics - Instruments and Installations. Method of Measurement and Investigation C-2

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 2985

Author : Kolomenskiy, A.A., Lebedev, A.N.
Inst : Physics Institute, Academy of Sciences USSR
Title : On the Effect of Quantum Radiation Fluctuations on the Trajectory of an Electron in a Magnetic Field

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 1, 205-207

Abstract : The effect of quantum radiation fluctuations on the betatron oscillations of electrons moving in an annular accelerator was considered by Sokolov and Ternov (Referat Zh. Fizika, 1955, 6219) on the basis of the Dirac equation. The authors of this work have shown that the same result can be obtained with the aid of the ordinary theory of betatron oscillations, taking into account the quantum character of the electromagnetic radiation. The authors also consider the fluctuations in the instantaneous stable orbit about the average value, caused by the radiation. In a remark added in proof, the authors cite without derivation a correction equation for the betatron oscillations, differing substantially from the Sokolov and Ternov equation.

Card : 1/1

SUBJECT USSR / PHYSICS CARD 1 / 2 PA-1252
AUTHOR KOLOMENSKIJ, A.A., LEBEDEV, A.N.
TITLE On the Part Played by Radiation Losses in Cyclic Accelerators.
PERIODICAL Žurn. eksp.i teor. fis, 30, fasc.6, 1161-1162 (1956)
Publ. 6 / 1956 reviewed 9 / 1956

The same authors (Dokl.Akad.Nauk, 106, 807 (1956), Zurn.eksp. i teor.fis, 30, 205 (1956) described the strong damping of betatron oscillations in connection with the relativistic motions of electrons in cyclic accelerators; these results are now generalized in the present work. The classical relativistic equation by DIRAC-LORENTZ serves as a basis from which the motion of an electron in an axially-symmetrical magnetic field H(r) in the neighborhood of the orbit with constant radius is investigated in the presence of an accelerating electric field $E_r=E_z=0, E_\theta = E(\theta,t)$. The equation for the azimuthal and for the radial motion are given in linear approximation. The term $(1-n)c^2\varrho/R^2$ occurring therein describes the "eigen damping" of the betatron oscillations and has, in comparison with the "main viscosity" $\sim W\varrho/E$ no influence on the motion as long as it applies that $|1-n| \ll (e/mc^2)^2$. The latter condition, however, is always valid. $\varrho = r/R - 1$, E - energy of the electron, and W - the power rate of radiation losses. On the main orbit of the accelerator the radiation losses are compensated, and the energy increases with increasing magnetic field. Next, the equations of synchrotron and betatron oscillations are given. They

Žurn. eksp. i teor. fis, 30, fasc. 6, 1161-1162 (1956) CARD 2/ 2 PA - 1252
are the generalization of the variation formula $a_{bet} \sim E^{-1/2}$ and $a_{..} \sim E^{-3/4}$ for the case with compensatable radiation losses. There follows a condition for motion in a curl field. The here discussed damping is in practice not connected with the concrete form of radiation losses which are compensateable by an exterior field.
The quantum corrections are then taken into consideration. When describing an electron with energies of up to $\sim 10^{15}$ eV it is, under normal circumstances, possible to use classical notions, and to be content with taking into account the statistical (quantumlike) character of the radiation. An additional term $W(R) - \sum_i \varepsilon_i \delta(t-t_i)$ then occurs in the equation of motion, where ε_i denotes the energy of a single photon emitted in the moment t_i and δ the delta function. In conclusion the mechanism of the damping of the betatron oscillations in consideration of the statistical character of the losses is investigated. On this occasion the change of the mass may be split into two parts: the energy loss on the occasion of the radiation and the energy increase at the expense of the accelerating field. The increase of the oscillation amplitude is fully compensated by radiation friction, and therefore the amplitude of the betatron oscillations is due only to the increase of mass caused by the compensated field.

INSTITUTION: Physical Institute "P.N.LEBEDEV" of the Academy of Science in the USSR.

LEBEDEV, A. N.

Category : USSR/Nuclear Physics - Instruments and Installations. Method of Measurement and Investigation. C-2

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 2984

Author : Kolomenskiy, A.A., Lebedev, A.N.
Inst : Physics Institute, Academy of Sciences USSR
Title : Effect of Radiation on the Motion of a Relativistic Electron in a Magnetic Field.

Orig Pub : Dokl. AN SSSR, 1956, 106, No 5, 807-810

Abstract : It is known that an electron moving in the magnetic field of an accelerator emits radiations and thus produces two types of phenomena. First, the quantum character of the radiation causes fluctuations in the betatron oscillations, and second, the radiation leads to the formation of radiation friction, which slows down or limits the fluctuation in the oscillations. The second of these effects has a purely classical origin and is due to the fact that the radiation of the electron is directed forward along its motion and is practically entirely confined within a narrow solid angle. It is shown that the

Card : 1/2

Category : USSR/Nuclear Physics - Instruments and Installations. Method of Measurement and Investigation. C-2

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 2984

mean squared deviation of the angle is

$$\overline{\theta^2_{rot}} = \frac{55\sqrt{3}}{96} \frac{R\lambda}{(1-n)^2}\left(\frac{E}{mc^2}\right)^2 \left(1 - e^{-t\frac{W}{E}}\right),$$

and the steady-state value of the fluctuations along the z axis is independent of the electron energy and equals

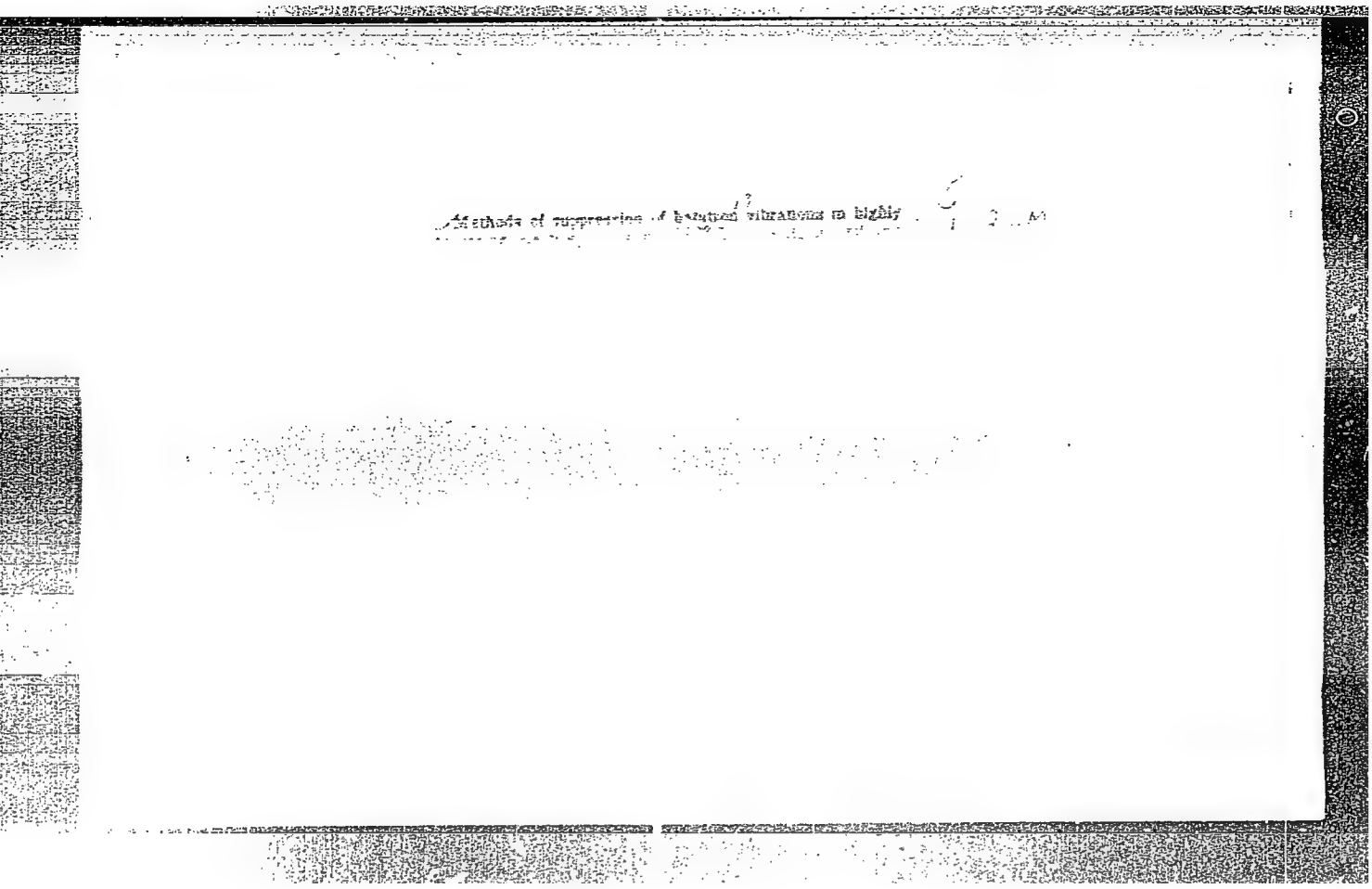
$$\overline{z^2} \cong \frac{\Delta R}{n}.$$

Here R is the radius of the orbit, $\lambda = \hbar/mc$, n the exponent of the decrease in the magnetic field, E the electron energy, t the time, and W the radiation power.

Card : 2/2

LEBEDEV, A.N., KOLOMENSKIY, A.A.

"The Effect of Radiation on the Motion of Relativistic Electrons in a synchrotron," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957



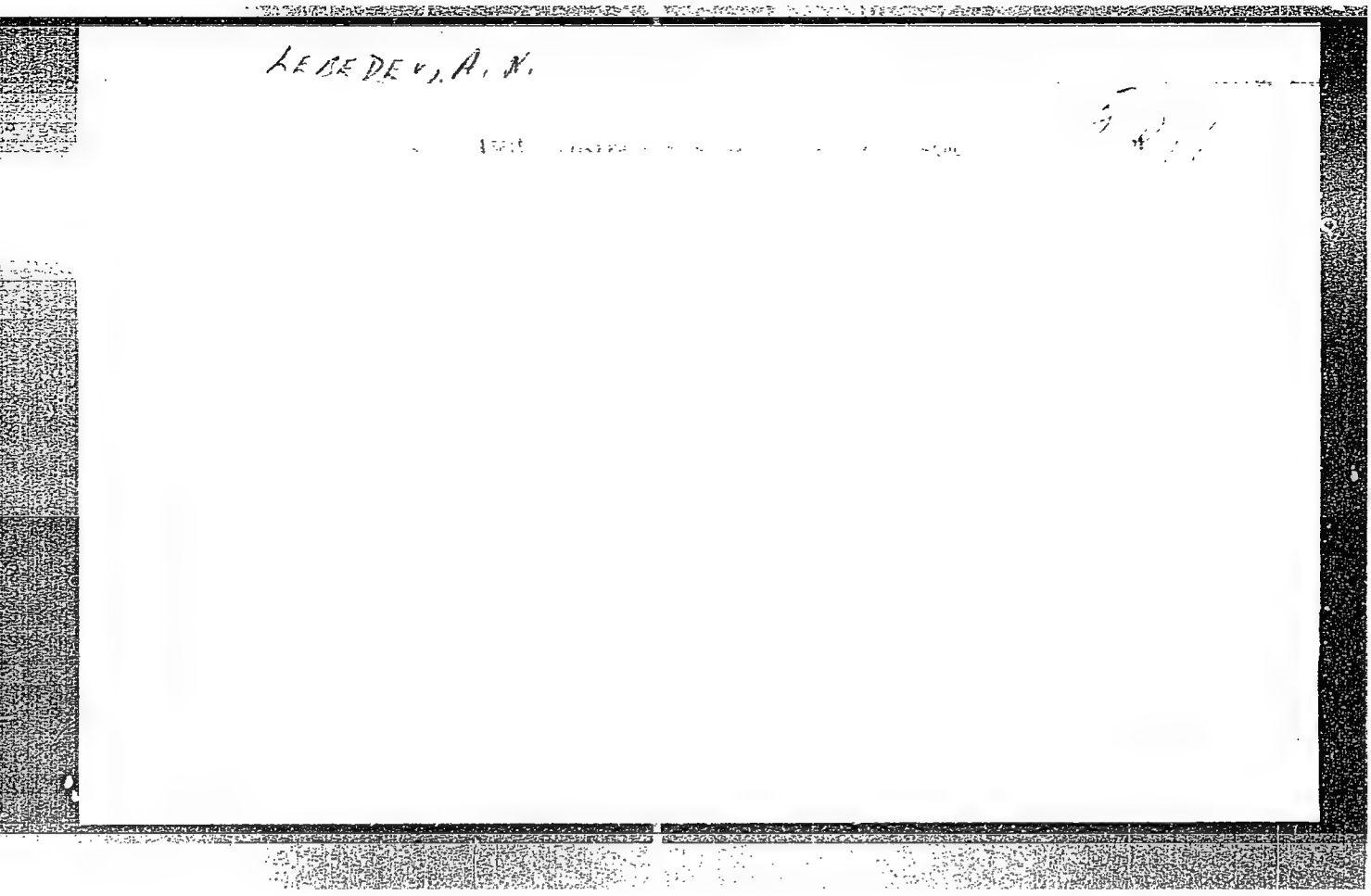
LEBEDEV, A. N.

4141
THE ROLE OF RADIATIONAL LOSSES IN CYCLIC ACCEL-
ERATORS. A. A. [illegible]

LEBEDEV, A.A

KOLOMENSKIY, A.A.; LEBEDEV, A.N.

Certain features of high-energy electronic cyclic accelerators.
Atom.energ.supplement no.4:31-48 '57. (MIRA 10:10)
(Particle accelerators)



21(9) SOV/89-5-5-2/27

AUTHORS: Kolomenskiy, A. A., Lebedev, A. N.

TITLE: On the Suppression of Betatron Oscillations in Strong-Focusing Electron Synchrotrons (O podavlenii betatronnykh kolebaniy v sil'nofokusiruyushchikh elektronnykh sinkhrotronakh)

PERIODICAL: Atomnaya energiya, 1958, Vol 5, Nr 5, pp 554-557 (USSR)

ABSTRACT: In references 2 and 3 several methods are suggested for the purpose of avoiding the building-up of oscillations and bringing about additional damping. These methods comprise

a) the formation of a radial dependence of the amplitude of the voltage of acceleration: $V_o = V_o(\varrho)$,

b) the use of an artificially established connection between ϱ- and Z-oscillations,

c) the use of special"damped" magnets.

The effectiveness of these methods is calculated theoretically. For all three methods the decrements of damping ξ are determined. It is stated that the curvature of the trajectories in the "damped" magnets must differ from the curvatures in

Card 1/2

On the Suppression of Betatron Oscillations in Strong-Focusing Electron Synchrotrons

the other principal sectors. It is shown that the sum of the decrements of damping is in all cases the same and that it does not depend on the nature of the damping system. By means of the method developed it is possible to deal also with other effects in which loss of intensity is bound to the energy of the particles. There are 6 references, 5 of which are Soviet.

SUBMITTED: October 28, 1957

Card 2/2

AUTHORS: Kovrizhnykh, L. M., Lebedev, A. N. 56-34-4-30/60

TITLE: The Consideration of the Collective Interaction of Electrons in Cyclic Accelerators (Uchet kollektivnogo vzaimodeystviya elektronov v tsiklicheskikh uskoritelyakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr. 4, pp. 984 - 992 (USSR)

ABSTRACT: The mathematical apparatus developed renders possible the taking into account of the collective interaction of the particles in cyclic accelerators. This mathematical apparatus is then applied to the problem of the capture of electrons as a betatron during the operation of an accelerator. First, the author gives a short survey of the problem in general. The first part of this paper deals with the raising of the problem. The state of the system of electrons in the chamber of the betatron is described in this paper by means of the distribution function $f(\vec{p}, \vec{q}, t)$, which is defined in the space of the coordinates and momenta. As initial equation, the equation $\partial f/\partial t + [\mathcal{H} f] = -\partial f/\partial t_{impact} - (f/\tau) + F_{true}$ is used. From the general form of the kinetic equation it is distinguished by the terms $-f/\tau$

Card 1/4

and F_{true}, which take into account the annihilation of the particles at the walls of the chamber and on the injector, as well as the forming of new particles caused by the operation of the injector. $\mathcal{H}$ denotes the Hamiltonian of the particle in consideration of the selfconsisting field. The term $(\partial f/\partial t)_{impact}$ which takes into account the collisions in pairs can be neglected. This paper investigates conditions of the betatron capture which are somewhat idealized, nevertheless it is possible to obtain the most important qualitative characteristics of this phenomenon, as well as certain quantitative estimations. The authors investigate in this paper the one-dimensional case, i.e. they take into account only the radial motion of the electrons the energy of which agrees with the equilibrium-energy. The following part of the paper deals with the basic features of the one-electron-capture, i. e. with the capture at low amperages intensities. The course of the computations is followed step by step. The following fact applies to the capture at low current intensities: The captured current

is weak and depends exponentially on the "error". In the third part the collective capture is computed. The coefficient of the collective capture, i.e. the ratio between captured and maximum current circulating in the chamber increases rapidly with increasing injection current and then shows a tendency towards saturation. Also the dependence of the captured current on the total emission current shows saturation. At low intensities of the total emission current, the captured current depends exponentially on the "error". In conclusion, the authors thank A.A.Kolomenskiy, M. S. Rabinovich and P. A. Ryazin for expressing their opinion of this work. There are 3 figures and 6 references, 4 of which are Soviet.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Institute of Physics imeni P. N. Lebedev, AS USSR)

SUBMITTED: November 26, 1957

The Consideration of the Collective Interaction of Electrons in Cyclic Accelerators 56-34-4-30/60

1. Electron accelerators---Theory

Card 4/4

LEBEDEV. A. N., Cand Phys-Math Sci -- (diss) "Problems in the theory of accelerating and storage systems at high beam intensities." Moscow, 1960. 7 pp; (Academy of Sciences USSR, Physics Inst im P. N. Lebedev); 150 copies; free; (KL, 17-60, 139)

0.0000

77229
SOV/89-8-1-23/29

AUTHOR: Lebedev, A. N.

TITLE: Scientific and Technical News. International Conference on Accelerators

PERIODICAL: Atomnaya energiya, 1960, Nr 1, pp 78-81 (USSR)

ABSTRACT: This is a report on the International Conference on High-Power Accelerators and Scientific Instrumentation held in Geneva on September 14-19, 1960.

Card 1/1

21(9)

S/025/60/000/03/014/045
D048/D002

AUTHOR: Lebedev, A.N., Scientific Co-worker

TITLE: A New Accelerator

PERIODICAL: Nauka i zhizn', 1960, Nr 3, pp 38 - 39 (USSR)

ABSTRACT: This article deals with the new synchrophasotron 19 at the European Nuclear Research Center in Geneva. This accelerator is based on the principle of "strong focusing", suggested independently from each other by N. Christophillos (1950), M. Livingstone, E. Courant (Ye. Kurant) and Kh. Sneider (1952). At present, Soviet physicists are developing a synchrophasotron for 50 to 60 billion electronvolt. Academician V.I. Veksler, head of the Soviet delegation at the International Conference on Accelerators, which took place in September 1959 in Geneva, is mentioned. There

Card 1/2

S/025/60/000/03/014/045
D048/D002

A New Accelerator

are 5 drawings and 1 photograph.

ASSOCIATION: Fizicheskiy institut imeni P.N. Lebedeva Akademii nauk SSSR (Institute of Physics im. P.N. Lebedev of the Academy of Sciences of the USSR)

Card 2/2

KOLOMENSKIY, A.A.; LEBEDEV, A.N.

Some properties of orbits in accelerators under conditions of similitude. Atom.energ. 8 no.6:553-555 Je '60.
(MIRA 13:6)

(Betatron)

S/089/60/009/003/003/014
B006/B063

AUTHOR: Lebedev, A. N.

TITLE: High-frequency Beam Storage in Cyclic Accelerators 19

PERIODICAL: Atomnaya energiya, 1960, Vol. 9, No. 3, pp. 189-193

TEXT: In the present paper, the author shows theoretically how important it is to take account of the disturbance of a stored beam by the following cycles of acceleration when investigating high-frequency beam storage in cyclic accelerators with constant magnetic fields. This disturbance leads primarily to an increase in the energy spread of the stored particles and to a change in their mean energy. First of all, the problem is treated in a general manner, the equation of motion is set up, and the conclusion to be drawn therefrom are discussed. In the following, the author studies only the equation of phase trajectories and the change in particle energy after one storage cycle. After this cycle, all of the particles have undergone a coordinate translation (amount of the translation: Δ). Expressions are given for Δ. Next, the author derives an equation for the distribution function for a large number of storage cycles. The disturbance of the beam by continuous separate cracks is examined, and the

Card 1/2

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High-frequency Beam Storage in Cyclic Accelerators

S/089/60/009/003/003/014
B006/B063

solution of the equation of the distribution function, given in the preceding section, is treated for a special case. The last section of the present article deals with the energy spread in a stored beam. The author thanks A. A. Kolomenskiy for a discussion of some basic problems. There are 1 figure and 2 non-Soviet references.

SUBMITTED: February 10, 1960

Card 2/2

33136

S/120/61/000/006/002/041
E032/E114

24.6730

AUTHOR: Lebedev, A.N.

TITLE: Phase stability in accelerators with arbitrary high-frequency field configuration

PERIODICAL: Pribory i tekhnika eksperimenta, no.6, 1961, 21-23

TEXT: The first part of this paper gives a derivation of a general phase equation for cyclic accelerators with arbitrary high-frequency field configuration and arbitrary equilibrium orbit. If the high-frequency field does not contain harmonics which are multiples of the frequency of betatron oscillations, it is sufficient to consider closed orbits. The position of the particle, or more precisely the centre of its betatron oscillations, is then completely determined by the energy E and the phase φ relative to the h.f. field. It is assumed that this field is periodic in time (period = $2\pi/\omega_0$). It is further assumed that in the given magnetic field there is a single equilibrium orbit $\underline{r}_s(\sigma)$ and the period of rotation on this orbit is such that:

Card 1/4

$$T_s = 2\pi\nu/\omega_s = 2\pi q/\omega_0 \qquad (1)$$

where q is an integer, σ represents arc length along the orbit, and the subscript s refers to the equilibrium orbit. It is assumed that the average energy is given by:

$$\frac{1}{\omega}\frac{dE}{dt} = \frac{e}{2\pi} U(E,\varphi) - \frac{1}{2\pi} W(E) \quad \text{and} \tag{2a}$$

$$d\varphi/dt = q(\omega_s - \omega) \tag{2b}$$

where ω is the frequency of revolution of a particle with energy E and phase φ, eU is the increase in the energy per revolution due to the electric field, and W is the energy loss per revolution. Subtracting from Eq.(2a) the corresponding expression for the equilibrium particle, it may be shown that

$$\frac{d}{dt}\left(\frac{E_s \dot{\varphi}}{q\mathcal{K}\omega_s^2}\right) + \frac{E_s}{q\mathcal{K}\omega_s}\ddot{\varphi} = \frac{e}{2\pi}\left[U(E_s,\varphi) - U(E_s,\varphi_s)\right] \tag{3}$$

where

Card 2/ 4

Phase stability in accelerators ...

$$\mathcal{K} = -\left(\frac{E}{\omega}\frac{\partial\omega}{\partial E}\right)_s, \qquad (4)$$

$$\Gamma = \left[\frac{1}{\omega_s^2}\frac{\partial\omega}{\partial t} + \frac{q}{\omega_s}\frac{\partial\omega}{\partial\varphi} - \frac{e}{2\pi}\frac{\partial U}{\partial E} + \frac{1}{2\pi}\frac{dW}{dE}\right]_{E=E_s}$$

In arriving at Eq.(3) the linear approximation in $E - E_s$ is employed and terms proportional to the square of the accelerating field are neglected. The partial derivative $\partial\omega/\partial t$ which enters into Eq.(4) is evaluated at constant energy (E_s) and the remaining partial derivatives are taken at constant (in time) magnetic field. It is then shown that with an arbitrary magnetic field configuration the first three components in the expression for Γ vanish identically, so that

$$\Gamma = (1/2\pi)(dW/dE) \qquad (5)$$

i.e. dissipative terms in the phase equation can only be due to the presence of radiation or some other analogous process

Card 3/4

Phase stability in accelerators ...

giving rise to energy loss. Whatever the high-frequency field configuration and form of the orbit, the damping of phase oscillations is determined only by the energy dependence of the losses. The general conclusion is that a modification of the high-frequency system of an accelerator can have no effect on the damping of synchrotron oscillations provided only that the high-frequency field is not in resonance with those oscillations.

Acknowledgments are expressed to A.A. Kolomenskiy and Yu.F. Orlov for interest and discussions.

There are 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc. The English language reference reads as follows:

Ref.5: J.G. Henry, J.Appl.Phys., 1960, v.31, 1338.

ASSOCIATION: Fizicheskiy institut AN SSSR
(Physics Institute, AS USSR)

SUBMITTED: April 18, 1961

Card 4/4

X

KOLOMENSKIY, Andrey Aleksandrovich; LEBEDEV, Andrey Nikolayevich; KOZLOV, V.D., red.; MURASHOVA, N.Ya., tekhn. red.

[Theory of cyclic accelerators]Teoriia tsiklicheskikh uskoritelei. Moskva, Fizmatgiz, 1962. 352 p. (MIRA 15:11)
(Particle accelerators)

4:570
S/057/62/032/010/008/010
B104/B102

24.6720

AUTHORS: Kolomenskiy, A. A., and Lebedev, A. N.

TITLE: Use of parameter random modulation in cyclic accelerators and in similar systems

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 10, 1962, 1237-1244

TEXT: A study is made of the particle motion in periodic systems whose parameters are subject to small time-dependent random fluctuations. An attempt is made to define characteristics describing the resonant excitation of betatron oscillations associated with parameter fluctuations. The disturbed motion is described by $x'' + (\nu^2+\xi(\vartheta))x = F(\vartheta)$ (1.1) where x is the deviation from the orbit, ν the ideal betatron oscillation, ϑ the generalized azimuth; $F(\vartheta)$ and $\xi(\vartheta)$ describe various disturbances; $\xi(\vartheta)$ consists of two components: $\xi(\vartheta) = \xi_n(\vartheta) + \xi_c(\vartheta)$ where $\xi_n(\vartheta)$ is connected with the asymmetry of the refractive index of the magnetic field and has the period 2π, and $\xi_c(\vartheta)$ is a random function. Solutions are sought in the form $x = a \exp(i\nu\vartheta)+c.c.$ (1.3). These relations are used to obtain

Card 1/5

Use of parameter random ....

$\dot{a} = \frac{1}{2i\nu}[F(\vartheta)e^{-i\nu\vartheta} - a\varepsilon(\vartheta) - a^*\varepsilon(\vartheta)e^{-2i\nu\vartheta}]$. (1.4) from (1.1), here the first term in the brackets corresponds to an external resonance force and the second term describes the phase modulation of the disturbances; the third term essential only if $\nu \simeq k/2$ (parametric resonance) or if $\varepsilon_{cn}(\vartheta)$ has a harmonic of $\omega \simeq 2\nu$ in its spectrum. $\varepsilon_{cn}(\vartheta)$ is assumed to be a relatively slow random process without any resonant harmonics, so that no noise parametric resonance is excited. In the case of external resonance ($\varepsilon_n = 0$, $\nu = k + \Delta$, $\Delta \ll 1$, k-integer) the system

$$\left.\begin{aligned} u' &= h_b \sin[\Delta\vartheta + \xi(\vartheta)], \\ v' &= h_b \cos[\Delta\vartheta + \xi(\vartheta)], \end{aligned}\right\} \quad \ldots \quad (1.6)$$

$$\left.\begin{aligned} -u \pm iv &= -a\exp(-i\xi), \\ \xi(\vartheta) &= \frac{1}{2\nu}\int \varepsilon_{cA}\, d\vartheta, \qquad h_b = \frac{|F_k|}{2\nu}, \end{aligned}\right\}$$

(1.7) is obtained from (1.4) where F_k is the k-th harmonic of $F(\vartheta)$. For parametric resonance ($F = 0$, $\varepsilon_n \neq 0$, $\nu = \frac{k}{2} + \Delta$)

$$v' = h_n[u\cos 2(\xi + \Delta\vartheta) + v\sin 2(\xi + \Delta\vartheta)], \qquad (1.10) \text{ is}$$

$$h_n = \frac{|\varepsilon_k|}{2\nu}.$$

Card 2/5

Use of parameter random ...

obtained from (1.4). If the correlation time of the random process $\xi(\vartheta)$ is much smaller than the period in which n and v are changed, the position of the mapping point in the (u, v) plane is described with the aid of the distribution function $W(u, v, \vartheta)$ that satisfies the Einstein-Fokker equation $\frac{\partial W}{\partial \vartheta} + \frac{\partial}{\partial u}\overline{\delta u}W + \frac{\partial}{\partial v}\overline{\delta v}W = \frac{\partial^2}{\partial u^2}\frac{\overline{(\delta u)^2}}{2}W + \frac{\partial^2}{\partial v^2}\frac{\overline{(\delta v)^2}}{2}W + \frac{\partial^2}{\partial u \partial v}\overline{\delta u \delta v}W$. (2.1). With (1.6) and (1.10) and assuming that $\xi(\vartheta)$ is a steady process with a dispersion σ the mean displacements entering in (2.1) are obtained for both types of resonance:

$$\left.\begin{aligned}\overline{\delta u} &= h\overline{\sin(\Delta\vartheta + \xi)} = h_b e^{-\frac{\sigma^2}{2}}\sin\Delta\delta \\ \overline{\delta v} &= h\overline{\cos(\Delta\vartheta + \xi)} = h_b e^{-\frac{\sigma^2}{2}}\cos\Delta\vartheta\end{aligned}\right\} \quad (2.2a),$$

$$\left.\begin{aligned}\overline{(\delta u)^2} &= \frac{h_b^2}{2}(J_1 + J_2\cos 2\Delta\vartheta), \\ \overline{(\delta v)^2} &= \frac{h_b^2}{2}(J_1 - J_2\cos 2\Delta\vartheta), \\ \overline{(\delta u \delta v)} &= -\frac{h_b^2}{2}J_2\sin 2\Delta\vartheta,\end{aligned}\right\} \quad (2.4)$$

(external resonance), $\left.\begin{aligned}\overline{\delta u} &= h_n e^{-2\sigma^2}(v\cos 2\Delta\vartheta + u\sin 2\Delta\vartheta) \\ \overline{\delta v} &= h_n e^{-2\sigma^2}(u\cos 2\Delta\vartheta - v\sin 2\Delta\vartheta)\end{aligned}\right\}$ (2.2b),

Card 3/5

Use of parameter random ...

$$\left.\begin{aligned}\frac{\overline{(\delta v)^2}}{2} \simeq \frac{\overline{(\delta u)^2}}{2} \simeq (u^2+v^2)D_n;\quad \overline{(\delta u \delta v)} \ll (u^2+v^2)D_n,\\ D_n = \frac{h_n^2}{2}J_1(2\sigma).\end{aligned}\right\} \text{(2.6b) where}$$

$$J_1(\sigma) = e^{-\sigma^2}\int_0^\infty (e^{\sigma^2 R(\tau)}-1)\,d\tau;\quad J_2(\sigma) = e^{-\sigma^2}\int_0^\infty (1-e^{-\sigma^2 R(\tau)})\,d\tau. \qquad \text{(2.5), (parametric resonance)}$$

These relations lead to Einstein-Fokker equations for both types of reso-nance. For external resonance it is shown that the rate of the dynamic build-up of the oscillations diminishes by a factor of $\exp(-\sigma^2/2)$. At the same time the amplitudes increase stochastically, in proportion to $\sqrt{\nu t}$. With parametric resonance the Einstein-Fokker equation cannot be solved analytically. It is shown that the noise modulation of the oscillation frequency reduces the dynamic effect of parametric resonance. However, this modulation causes simultaneously a stochastic build-up of the oscilla-tions, characterized by the diffusion coefficient. Finally, an estimate is made of the interval $\mathcal{L}$ in which the system is in resonance before the mean square betatron oscillation amplitude rises to a considerable amount. $\mathcal{L}_{max}$ satisfies the inequality $\mathcal{L}_{max} \leq \nu/2\overline{h}_n^2$ and in the dynamic case has the

Card 4/5

S/057/62/032/010/008/010
B104/B102

Use of parameter random ...

value $\nu_{max} = \frac{1}{2h_n}$. In the ideal case, when a noise exists, the possible holding time increases to the $\nu/\bar{z}h_n$ times. There are 2 tables.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR, Moskva
(Physics Institute imeni P. N. Lebedev AS USSR, Moscow)

SUBMITTED: November 30, 1961

Card 5/5

KOLOMENSKIY, A.A.; LEBEDEV, A.N.

Autoresonance motion of a particle in a plane electromagnetic wave. Dokl.AN SSSR 145 no.6:1259-1261 Ag '62. (MIRA 15:8)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR. Predstavleno akademikom V.I.Veksslerom.
(Dynamics of a particle) (Electromagnetic waves)

VORONIN, Ivan Vasil'yevich, prof.; ZDRAYKOVSKIY, Dionis Iosifovich; KOZLOV, Nikolay Andreyevich; LEBEDEV, Arseniy Andreyevich; SEMENOV, Izosim Alekseyevich; SUDACHKOV, Yevgeniy Yakovlevich; VASIL'YEV, P.V., doktor ekon. nauk, retsenzent; KARASIKOV, S.A., retsenzent; MOTOVILOV, G.P., red.; SVETLAYEVA, A.S., red. izd-va; POPOVA, V.V., tekhn. red.

[Economics, organization and planning of lumbering production in lumbering camps] Ekonomika, organizatsiia i planirovanie lesokhoziaistvennogo proizvodstva v leskhozakh i lespromkhozakh. Izd.2, dop. i perer. [By] I.V.Voronin i dr. Moskva, Goslesbumizdat, 1963. 299 p. (MIRA 17:2)

AM4007949 BOOK EXPLOITATION S/

Lebedev, Andrey Nikolayevich

Simulation modeling of transcendental equations (Modelirovaniye transtsendentny*kh uravneniy) Leningrad, Sudpromgiz, 1963. 187 p. illus., biblio. 4400 copies printed.

TOPIC TAGS: transcendental equation simulation, mathematical analog design, root inspection method, mathematical simulation scheme, simulation scheme stability, simulation scheme convergence

PURPOSE AND COVERAGE: This book is intended for scientific and engineering workers engaged in the study of problems in the field of ship automation, automatic control, and computing mathematics. It may also be useful to students in schools of higher education who are specializing in these fields. The book discusses the principal problems of calculating and designing mathematical analogs for solving transcendental or algebraic equations or systems of equations by the root-inspection method. A short review is given of numerical methods for the solution of equations used for the designing, adjusting,

Card 1/5

AM4007949

and verification of mathematical analogs, and typical schemes for mathematical simulation, their stability, convergence, and exactness are studied. Many concrete examples are provided. The author thanks R. I. Ginsburg, V. I. Malin, N. M. Mozzhukin, P. A. Trevogin, Ya. M. Tsetlin, and R. V. Shipchinskaya for discussing the manuscript.

TABLE OF CONTENTS:

Card 2/5

L 46160-65 EWT(m)/EPA(w)-2/EWA(m)-2 Pab-10/Pt-7 IJP(c) GS

ACCESSION NR: AT5007925 S/0000/64/000/000/0365/0367

46
45
B+1

AUTHOR: Kolomenskiy, A. A.; Lebedev, A. N.; Fateyev, A. P.

TITLE: Interaction of colliding beams in storage systems

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 365-367

TOPIC TAGS: high energy accelerator, charged particle beam, plasma physics

19

ABSTRACT: The theoretical investigation of the dynamics of beams in storage systems that takes into consideration their electromagnetic interaction is involved with great difficulties and requires the solution of self-consistent kinetic equations. The present report, therefore, discusses the qualitative picture of the occurring phenomena on the basis of certain simplified model representations which reflect in one way or another the specifics of storage systems. The given expressions are mainly related to so-called concentric systems and particularly to symmetric ring phasotrons, where the colliding beams of identical particles intersect on each revolution several times. The report discusses only the behavior of orbits of two steady-state beams which circulate in an ideal magnetic field and lie in one plane. It is concluded that the effects enumerated in the report do not by any

Card 1/2

L 46160-65

ACCESSION NR: AT5007925

means exhaust the behavioral peculiarities of the orbits for large currents. The real picture must be essentially complicated through a possible splitting of the beam of given dimension, through the appearance of specific plasma instabilities, and through other effects. Orig. art. has 3 figures.

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSSR (Physics Institute AN SSSR)

SUBMITTED: 26May64 ENCL: 00 SUB CODE: NP

NO REF SOV: 002 OTHER: 000

Card 2/2

KOLOMENSKIY, A.A.; LEBEDEV, A.N.

Resonance phenomena in the motion of a particle in a plane electromagnetic wave. Zhur. eksp. i teor. fiz. 44 no.1:261-269 Ja '63. (MIRA 16:5)

(Dynamics of a particle) (Electromagnetic waves)

LEBEDEV, A.N. (Leningrad)

Derivation of resistance relationships on potentiometers with respect to displacement in presence of extremum points. Elektrichestvo no.5:71-74 My '63. (MIRA 16:7)

(Potentiometers)
(Electric networks)
(Electric measurements)

AM4037984 BOOK EXPLOITATION S/

Smolov, Vladimir Borisovich; Lebedev, Andrey Nikolayevich; Sapozhkov, Konstantin Andreyevich; Dubinin, YAkov Ivanovich; Smirnov, Nikolay Anisimovich; Bodunov, Vasiliy Pavlovich; Ugryumov, YEvgeniy Pavlovich; YAtsenko, Vladimir Pavlovich

Analog computers (Vy*chislitel'ny*ye mashiny* neprery*vnogo deystviya), Moscow, "Vy*sshaya shkola", 1964, 552 p. illus., biblio. 23,000 copies printed. Textbook for university students.

TOPIC TAGS: analog computer, automation, computer engineering

TABLE OF CONTENTS [abridged]:

Card 1/2

AM4037984

SUB CODE: DP, MA SUBMITTED: 26Oct63 NR REF SOV: 004

OTHER: 000 DATE ACQ: 07May64

Card 2/2

KOLOMENSKIY, A.A., glav. red.; KUZNETSOV, A.B., red.; LEBEDEV, A.N., red.; ALYAB'YEV, A.F., red.; MURADOVA, A.A., red.; SMIRNOV, I.P., red.

Transactions of the International Conference on High Energy Accelerators. Trudy Mezhdunarodnoi konferentsii po uskoriteliam. Pod red. A.A.Kolomenskogo, A.B.Kuznetsova, A.N.Lebedeva. Moskva, Atomizdat, 1964. 1091 p. [In Russian and English] ___ List of participants of the International Conference on High Energy Accelerators. Spisok uchastnikov Mezhdunarodnoi konferentsii po uskoriteliam (Dubna, 21-27 avgust 1963 g.). Moskva, Atomizdat, 1964. 13 p. (MIRA 17:9)

1. International Conference on High Energy Accelerators. Dubna, 1963. 2. Fizicheskiy institut im. P.N.Lebedeva AN SSSR, Moskva (for Kolomenskiy, Lebedev).

BULEYKO, Vitaliy Borisovich; LEBEDEV, A.N., kand. tekhn. nauk, dots., retsenzent; SMOLOV, V.B., kand. tekhn. nauk, dots., red.

[Tuned four-terminal networks and their use in computer engineering] Rezonansnye chetyrekhpoliusniki i ikh primenenie v vychislitel'noi tekhnike. Moskva, Energiia, 1964. 142 p. (Biblioteka po avtomatike, no.103) (MIRA 17:9)

S/0057/64/034/005/0812/0817

ACCESSION NR: AP4035688

AUTHOR: Lebedev, A.N.

TITLE: On force-free current distributions

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.5, 1964, 812-817

TOPIC TAGS: magnetic field, force-free field, current distribution, plasma physics

ABSTRACT: Because of their importance for astrophysical problems, their possible significance in plasma physics, and their potential technical application to the production of strong magnetic fields, current distributions were investigated for which the Lorentz force vanishes. The condition that a current distribution be force-free is that the current be everywhere parallel to the magnetic field, i.e., that the ratio of the current to the magnetic field be a scalar. S.Chandrasekhar & D.Kendall (Proc.Nat.Acad.Sci.USA 42,1,1956; Astrophys.J.126,457,1957) have expressed the general force-free current distribution for which the scalar ratio of the current to the field is constant in terms of an arbitrary solution of Helmholtz' wave amplitude equation. This solution is discussed briefly. The general axially symmetric force-free current distribution is derived, for which the scalar ratio of our-

Card 1/2

ACCESSION NR: AP4035688

rent to field may depend on position. The solution is performed in a coordinate system in which the ratio of current to field appears as one of the coordinates. The final result is expressed in cylindrical coordinates and involves an arbitrary function and a solution of a non-linear generalization of Helmholtz' equation. Several particular solutions are discussed. One of these can be modified to form an almost force-free solution for a toroidal field, in which the force is reduced by a factor approximately equal to the square of the ratio of the radii of the torus. Orig. art. has: 36 formulas.

ASSOCIATION: Fizicheskiy institut im. P.N.Lebedeva AN SSSR Moscow (Physical Institute, AN SSSR)

SUBMITTED: 24May63 DATE ACQ: 20May64 ENCL: 00

SUB CODE: EM NR REF SOV: 000 OTHER: 005

Card 2/2

L 4240-66 EWT(l)/EWT(m)/EPA(w)-2/EWA(m)-2/EWA(h) IJP(c) GS
ACCESSION NR: AT5007974 S/0000/64/000/000/1030/1035

48
43
B+1

AUTHOR: Kolomenskiy, A. A.; Lebedev, A. N.

TITLE: Self-excited resonant acceleration of particles by plane electromagnetic waves

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy, Moscow, Atomizdat, 1964, 1030-1035

TOPIC TAGS: high energy accelerator, electromagnetic wave, waveguide, transmission line

ABSTRACT: Existing methods for the acceleration of charged particles by traveling electromagnetic waves propose to utilize slow waves having a longitudinal component of the electromagnetic field, i. e. to apply loaded waveguides. High mechanical and radioengineering precision in accelerators that operate according to this principle makes, in the authors' opinion, the search for other methods interesting. This is especially important in the passage to very small wavelengths (say, in the visible range), where the technical difficulties connected with the creation of a waveguide system increase up to limits almost known. At the same time one can expect to obtain, namely in the given range, very large electric field strengths E by

Card 1/3

L 4240-66

ACCESSION NR: AT5007974

the methods of quantum radiophysics, and it would be important to attempt to utilize this field for purposes of particle acceleration. As shown in works by the authors (DAN 145, 1259 (1962); *ZhETF* 44, 261 1963)), there exists in principle the possibility of resonant movement in a free plane electromagnetic field, which is achieved by the imposition of a suitable magnetic field and by the selection of special initial conditions. Thus, for example, resonant movement can be actually realized for wave frequency 10^{15} hertz and magnetic field of the order of 10 to 100 kilogauss occupying a comparatively small volume. The possibility of the practical utilization of the considered mechanism depends in large degree upon progress in the field of obtaining large high-frequency power, in the field of creating superstrong magnetic fields, etc. The present report presents concrete examples, which will serve mainly for purposes of orientation, including the general case of a plane wave propagated with arbitrary phase velocity βc, which holds true in various media. It is shown that precise resonance in a certain sense is impossible for $\beta^2 \neq 1$. The possibility of self-excited resonant interaction is discussed, and shown to be based physically on two circumstances: (a) phase velocity of the wave equals c; (b) the wave is purely transverse and is in no way connected with the assumption of field homogeneity in the transverse plane. Besides free space, the conditions (a) and (b) are also satisfied by ideal transmission lines (but not

Card 2/3

L 4240-66

ACCESSION NR: AT5007974

5

waveguides). Also discussed are the theoretical limitations connected with the presence of radiational effects in the case of movement along a spiral-shaped trajectory. "In conclusion the authors thank V. L. Ginzburg and I. M. Frank for discussion of the results, and also V. S. Voronin and G. I. Kharlamova for their assistance in the work." Orig. art. has: 3 figures, 26 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

SUBMITTED: 26May64 ENCL: 00 SUB CODE: NP,

NO REF SOV: 002 OTHER: 000

BVK

Card 3/3

L 61060-65 EPA(w)-2/EWT(1)/EWA(m)-2 Pi-4/Pz-6 IJP(c) AT
ACCESSION NR: AP5013898 UR/0056/65/048/005/1393/1397

AUTHOR: Lebedev, A. N.

TITLE: Contribution to the theory of runaway electrons

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 5, 1965, 1393-1397

TOPIC TAGS: neutral plasma, homogeneous plasma, electron distribution function, runaway electron, electron flux, field dependence

ABSTRACT: An analytic expression is derived for the electron distribution function in a neutral spatially homogeneous plasma in the presence of a weak electric field. Principal attention is paid to the computation of the flux of the so-called runaway electrons, which have a sufficiently high velocity, so that collisions with other plasma particles have practically no influence on their acceleration. The flux of the runaway electrons and its dependence on the field strength is obtained asymptotically by using the behavior of the distribution function at infinity. The treatment of the problem is similar to that used by A. V. Gurevich (ZhETF v. 39, 1296, 1960), but the results are made applicable to large velocities by using different independent variables and different expansions. The method described can be easily used also for the case of multiply ionized plasma and for investigations of pro-

Card 1/2

L 61060-65
ACCESSION NR: AP5013698

cesses that lead to the establishment of a stationary state. Orig. art. has: 2 figures and 13 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences SSSR)

SUBMITTED: 23Nov64 ENCL: 00 SUB CODE: ME, NP

NR REF SOV: 001 OTHER: 002

Card 2/2

L 27548-66 EWT(1)/EWT(m) IJP(c) GG

ACC NR: AP6014051 SOURCE CODE: UR/0056/66/050/004/1101/1106

57
B

AUTHOR: Kolomenskiy, A. A.; Lebedev, A. N.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

19

TITLE: Quasilinear acceleration of particles by a transverse electromagnetic wave

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 4, 1966, 1101-1106

TOPIC TAGS: particle acceleration, charged particle, electromagnetic interaction, laser application

ABSTRACT: The authors develop certain ideas presented in an earlier paper (ZhETF v. 44, 261, 1963) and propose a new mechanism for the acceleration of charged particles in the field of a plane electromagnetic wave. The mechanism consists of selecting a time-invariant magnetic field (synchronizing field) such that the particle is made to move in it along a trajectory in which the field does work on the particle and contributes to the acceleration. This mechanism obviates the need for the customary slow-wave structures used in conventional linear accelerators. Relations between the particle energy and the longitudinal coordinate are derived for both relativistic and nonrelativistic particles, and the requirements that must be satisfied by the synchronizing magnetic field are established. Advantages of the proposed system are the fact that a time-invariant magnetic field is relatively easy to build and its use

2

Card 1/2

L 27548-66

ACC NR: AP6014051

permits particle injection to be effected during each cycle of the high-frequency field of the wave. This makes large particle-beam intensities possible in principle. There are grounds for assuming that the required intensities of microwave and light waves necessary for this purpose will be realized in the near future, making the method likewise realizable. The principle of the method itself lends itself to further refinement. Orig. art. has: 28 formulas. [02]

SUB CODE: 20/ SUBM DATE: 18Nov65/ ORIG REF: 001/ ATD PRESS: 4260

Card 2/2 BLG

LEBEDEV, A.N.

"A Method of Calculating Analytical Machines for a Given Accuracy," (Candidates Dissertation, 1946, Leningrad Electrical Engineering Institute im V.I. Ul'yanov Lenin, Izyenbek, Prof, official opponent)...
SO: Elektrichestvo, No 7, 1948...

LEBEDEV A. N.

PA 44/49T35

USSR/Electronics May/Jun 49
Servomechanisms

"The Problem of Automatic Construction of a Vector According to Its Two Components," A. N. Lebedev, Leningrad Elec Eng Inst imeni V. I. Ul'yanov-Lenin, 7 pp

"Avtomat i Telemekh" Vol X, No 3

Mathematical investigation of the total effective operation of a coordinator with two tracking systems which serves to automatically set up a vector according to its two components. Shows that the following are necessary for stable

44/49T35

USSR/Electronics (Contd) May/Jun 49

performance: (1) combination of contacts of servomotors and governing mechanisms varies with the vector's angle of rotation, and (2) speed of rotation of one of the servomotors varies with the vector's magnitude. Submitted 7 Jul 47.

44/49T35

LEBEDEW, A.N. Cand. Tech. Sci.

"A Mathematical Theory of a Quadratic Switch,"

SO: Elektrichestvo, No 1, 1946.

LEBEDEV, A.N., dots., kand.tekhn.nauk

Theory of the automatic solving of systems of two algebraic equations. Izv.LETI no.25:28-39 '53. (MLRA 13:2)
(Electronic calculating machines)

LEBEDEV, A. N.

NOVOSEL'TSEV, Ya.V.; LEBEDEV, A.N.; MAGIN, S.M., inzhener, retsenzent; KOGAN, B.S., inzhener, retsenzent; FAHMAKOVSKIY, S.F., kandidat tekhnicheskikh nauk, redaktor.

[Computing devices] Schetno-reshaiushchie ustroistva. Leningrad, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry [Leningradskoe otd-nie] 1954. 399 p. (MLRA 7:8)
(Calculating machines)

PHASE I BOOK EXPLOITATION SOV/1782

28(2)

Lebedev, Andrey Nikolayevich

Schetno-reshayushchiye ustroystva (Analog Computers) Moscow, Mashgiz, 1958. 378 p. Errata slip inserted. 10,000 copies printed.

Reviewer: S.O. Dobrogurskiy, Doctor of Technical Sciences, Professor; Ed.: B.G. Dostupov, Doctor of Technical Sciences; Ed. of Publishing House: A.M. Monastyrskaya; Tech. Ed.: V.D. El'kind; Managing Ed. for Literature on Machine Building and Instrument Construction: N.V. Pokrovskiy, Engineer.

PURPOSE: The book is intended as a textbook for students of polytechnical, power, and radio engineering vuzes taking courses in analog computing systems. It may also be useful for students studying instruments of automatic control, telemechanics and electrical measurements, and for engineers and designers in the fields of computing technique, automation and manufacturing of instruments.

COVERAGE: The book presents fundamentals of the theory of analog computing systems. Analog computing mechanisms and the principles of construction of the simplest analog computing systems are studied.

Card ~~1/ 10~~

ALEKPEROV, V.P., inzh.; ATOVMYAN, I.O., inzh.; ZUYEV, V.I., inzh.; KAVUN, Ye.S., kand.tekhn.nauk; KOGAN, B.Ya., kand.tekhn.nauk; KOPAY-GORA, P.N., kand.tekhn.nauk; KULAKOV, A.A., inzh.; LEBEDEV, A.N., kand. tekhn.nauk; PAPERNOV, A.A., doktor tekhn.nauk; PEL'POR, D.S., doktor tekhn.nauk; PLOTNIKOV, V.N., kand.tekhn.nauk; RUZSKIY, Yu.Ye., kand.tekhn.nauk; SOLODOVNIKOV, V.V., doktor tekhn.nauk; TOPCHEYEV, Yu.I., kand.tekhn.nauk; ULANOV, G.M., kand.tekhn.nauk; SHRAMKO, L.S., kand.tekhn.nauk; DOBROGURSKIY, S.O., doktor tekhn. nauk, retsenzent; KAZAKOV, V.A., kand.tekhn.nauk, retsenzent; PETROV, V.V., kand.tekhn.nauk, retsenzent; KHAVKIN, G.A., inzh., retsenzent; SOLODOVNIKOV, V.V., prof., doktor tekhn.nauk, red.; VITENBERG, I.M., kand.tekhn.nauk, nauchnyy red.; MOLDAVER, A.I., kand.tekhn.nauk, nauchnyy red.; KHETAGUROV, Ya.A., kand.tekhn.nauk, nauchnyy red.; POLYAKOV, G.F., red.izd-va; KONOVALOV, G.M., red. izd-va; SOKOLOVA, T.F., tekhn.red.

[Fundamentals of automatic control] Osnovy avtomaticheskogo regulirovaniia. Vol.2. [Elements of automatic control systems] Elementy sistem avtomaticheskogo regulirovaniia. Pt 2. [Compensating elements and computer components] Korrektiruiushchie elementy i elementy vychislitel'nykh mashin. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit.lit-ry. 1959. 453 p. (MIRA 12:4)
(Automatic control) (Electronic apparatus and appliances)
(Electronic calculating machines)

66204

SOV/146-58-6-5/16

~~16(1)~~ 16.9500

AUTHOR: Lebedev, A.N., Docent

TITLE: The Necessary Stabilization Conditions of Mathematical Devices for Solution of Algebraic and Transcendental Equations with Three and More Unknowns by the Methods of Roots Selection

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Priborostroyeniye, 1958, Nr 6, pp 38-49 (USSR)

ABSTRACT: A generalized layout of a mathematical device for solution of a system of three algebraic or transcendental equations is given in figure 1. Depending on using of the switch P, there are 6 variants possible. The selection of variants depends on condition under which the device in question will be more sensitive to the action of reactive coupling. The layout has three reactive coupling lines comprising the sensitive elements which work out the signals, the signs of which coincide with the signs of the continuous functions Φ_1, Φ_2, Φ_3, etc. At the outlet of each re-

Card 1/3

The Necessary Stabilization Conditions of Mathematical Devices for Solutions of Algebraic and Transcendental Equations with Three and More Unknowns by the Methods of Roots Selection

active coupling line, a precisely definite root Z_1, Z_2, and Z_3 is realized. For variant I, the conditions are expressed by the following formulae:

$$\text{sign}\ (\Delta Z_1) = \text{sign}\ (-\frac{\Phi_1}{\Phi_{11}})$$

$$\text{sign}\ (\Delta Z_2) = \text{sign}\ (-\frac{\Phi_2}{\Phi_{22}})$$

$$\text{sign}\ (\Delta Z_3) = \text{sign}\ (-\frac{\Phi_3}{\Phi_{33}})$$

The author then gives the corresponding formulae for other 5 variants. In conclusion, he states that the above method of stabilization of mathematical devices surmises the absence of inertia in them. Therefore, in general, this method permits deduction of only the most necessary, and not all sufficient conditions; that is why it is indispensable to research the design as a system of automatic regulation, taking into account its inertia.

Card 2/3

4

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SOV/146-58-6-5/16

The Necessary Stabilization Conditions of Mathematical Devices for Solution of Algebraic and Transcendental Equations with Three and More Unknowns by the Methods of Roots Selection

There are 1 table, 5 diagrams, and 1 Soviet reference.

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut imeni V. I. Ul'yanova (Lenina) (Leningrad Electrotechnical Institute imeni V.I. Ul'yanov (Lenin))

SUBMITTED: July 22, 1958

Card 3/3

28(2) SOV/146-2-5-12/19

AUTHOR: Lebedev, A.N., Candidate of Technical Scienc, Docent

TITLE: Constructing Electronic Mathematical Computers for Solving the Systems of two Algebraic or Transcendence Equations by Means of the Root-Selection Method

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Priborostroyeniye, 1959, Nr 5, pp 72 - 79 (USSR)

ABSTRACT: The electronic computers discussed (Figure 1) have a calculating device and two feedback lines comprising amplifiers and sensitive and working elements previously described by the author [Ref 1]. The models can be designed in two ways and only differ in the arrangement of these elements. The mathematical investigation carried out in this article concerns ideal inertia-free models. This article was recommended by the Kafedra matematicheskikh i schetno-reshayushchikh priborov i ustroystv (The Chair of Mathematical and Computing Devices

Card 1/2

SOV/146-2-5-12/19

Constructing Electronic Mathematical Computers for Solving the Systems of two Algebraic or Transcendence Equations by Means of the Root-Selection Method.

and Instruments). There are 2 diagrams and 1 Soviet reference.

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut imeni V.I. Ul'yanova (Lenina) (The Leningrad Electrical Engineering Institute imeni V.I. Ul'yanov/Lenin)

SUBMITTED: March 4, 1958

Card 2/2

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S/144/60/000/01/006/019
E031/E135

AUTHOR: Lebedev, A.N., Candidate of Technical Sciences, Docent

TITLE: The Stability of Automatic Control Systems with One Controllable Quantity and Several Equilibrium Positions

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1960, Nr 1, pp 43-47 (USSR)

ABSTRACT: The behaviour of automatic control systems with one controllable quantity is in general described by a set of non-linear differential equations. The system can be regarded as in the dynamic regime and providing a model for the solution of the equations. If the derivatives are set zero, we obtain the equation for the static regime. The real roots of this equation correspond to the equilibrium positions. The following theorem is stated: if the static equation of the automatic control system, $f(x) = 0$ has N distinct real roots x_k ($k = 1,2, \ldots, N$), and if the function $f(x)$ is continuous and has a continuous derivative $\partial f/\partial x$ which does not vanish for any x_k, then the system has N positions of equilibrium which are successively stable and unstable. Various fairly obvious deductions are

Card 1/2

63195
S/144/60/000/01/006/019
E031/E135

The Stability of Automatic Control Systems with One Controllable Quantity and Several Equilibrium Positions

drawn from this theorem. The particular case $(\partial/\partial x)\, f(x_k) = 0$ is discussed. This condition means that the static equation has a multiple root. If the multiplicity is even, $f(x)$ has an extremum at the point; if it is odd, the function has a point of inflection. The evaluation of higher derivatives will decide whether the multiplicity of the root is even or odd. A simple example forms the appendix to the paper. There are 4 figures and 3 Soviet references.

ION: Kafedra schetnoreshayushchey tekhniki, Leningradskiy elektrotekhnicheskiy institut
(Chair of Computing Techniques, Leningrad Electrical Engineering Institute)

October 17, 1959

4

LEBEDEV, A.N.

Behavior of mathematical models for solution of transcendental and algebraic equations having several real roots. Izv.vys.ucheb.zav.; prib. 3 no.2:44-51 '60. (MIRA 14:4)

1. Leningradskiy elektrotekhnicheskiy institut imeni V.I.Ul'yanova (Leinina). Rekomendovana kafedroy schetno-reshayushchey tekniki.
(Electronic analog computers)

S/194/62/000/004/026/105
D222/D309

IL.8000

AUTHOR: Lebedev, A. N.

TITLE: Stability of complex nonlinear automatic control systems

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 4, 1962, abstract 4-2-76u (Izv. Leningr. elektrotekhn. in-ta, 1961, no. 45, 169-174)

TEXT: The analyzed system is described by a differential equation of the following form:

$$\psi\left(x_i, z, \frac{d^j z}{dt^j}\right) = 0, \quad i = 1,\ldots,m; \; j = 1,\ldots,n$$

where x_i are the values of the input coordinates, z is the output

Card 1/ 3

coordinate of the system. The statical equation of the system $(d^j z/dt_j) = 0$ is considered; the equilibrium states of the system are determined by the solutions for Z of the transcendent or algebraic equation:

$$\psi\left(X_i,\ Z,\ \frac{d^j Z}{dt_j} = 0\right) = 0$$

This makes it possible to use, in investigating the stability of the solutions found in this way, the solutions of the stability condition of a corresponding mathematical model. The necessary conditions of stability (the so-called principal stability) of the equilibrium positions (if they exist in the real domain) are given. These conditions are derived for the case of one, two, etc. possible positions of equilibrium. If the possible number of equilibrium positions is greater than one, then a rule is given for the construction of the stability region with respect to the Z

S/194/62/000/004/026/105
D222/D309

Stability of complex ...

values of the equilibrium positions. A number of examples are given. 5 references. [Abstracter's note: Complete translation.]

1/3

Card 3/3

LEBEDEV, A.N.

Transformation of related static errors of analog computers. Izv.vys.ucheb.zav.; prib. 5 no.3:77-81 '62. (MIRA 15:8)

1. Leningradskiy elektrotekhnicheskiy institut imeni V.I. Ul'yanova (Lenina). Rekomendovana kafedroy schetno-reshayushchey tekhniki.

(Electronic anlog computers)

LEBEDEV, A.N.

Classification of errors of an analog computer. Izv.vys.ucheb. zav.; prib. 5 no.6:67-70 '62. (MIRA 15:12)

1. Leningradskiy elektrotekhnicheskiy institut imeni V.I. Ul'yanova (Lenina). Rekomendovana kafedroy schetno-reshayushchey tekhniki.

(Electronic analog computers)

DUBININ, Ya. I., kand. tekhn. nauk, dotsent; LEBEDEV, A. N., kand. tekhn. nauk, dotsent; YATSENKO, V. P., assistent

Practical criterion on the correspondence of theoretical and experimental distribution of a random magnitude. Izv. LETI 59 no.46:106-117 '62. (MIRA 15:10)

(Mathematical statistics)
(Distribution(Probability theory))

L 19426-63 EWT(d)/FCC(w)/BDS AFFTC/IJP(C)

ACCESSION NR: AR3005389 S/0044/63/000/006/V012/V012

53

SOURCE: RZh. Matematika, Abs. 6V42

AUTHOR: Lebedev, A. N.

TITLE: The solution of transcendental equations by the method of root selection on paper and with the aid of mathematical models 16

CITED SOURCE: Izv. Leningr. elektro-tekh. in-ta, vyp, 47, 1962, 157-170

TOPIC TAGS: transcendental equation, mathematical model, three-equation system, root selection

TRANSLATION: In solving the equation $f(x) = 0$ the author suggests a number of attempts to choose two values a and b such that the function has a different sign for each of them, whereupon the problem is reduced to analyzing the sign of the function at various points of the segment. He describes the scheme of a model based on such analysis and intended for the solution of an equation depending on the parameters $f(x_1,u_1,\ldots,u_n) = 0$. The basic element of the scheme must generate the control signal (for varying the argument x) whose sign is determined by the sign of the function $f(x,u_1,\ldots,u_n)$. In the case of a system of two equations $f_1(x,y) = 0, f_2(x,y) = 0$

Card 1/2

L 19426-63
ACCESSION NR: AR3005389

the analysis of the signs of f_1 and f_2 is also possible, but more complex. Another method of solving the system is also suggested. Considering x a parameter, the above method can be used to determine $y = y_1(x)$ from the first equation and $y = y_2(x)$ from the second equation. The problem is then reduced to the solution of a single equation $y_1(x) - y_2(x) = 0$. The scheme of the corresponding model is given. This method may be extended for an even greater number of equations. Three-equation systems are examined in particular. V. Zaguskin.

DATE ACQ: 24Jul63 SUB CODE: MM ENCL: 00

Card 2/2

LEBEDEV, Andrey Nikolayevich; GINZBURG, R.I., kand. tekhn. nauk, retsenzent; MAGIN, S.M., inzh., retsenzent; MOZZHUKHIN, N.M., kand. tekhn. nauk, retsenzent; TREVOGIN, P.A., kand. tekhn. nauk, retsenzent; TSEYTLIN, Ya.M., nauchnyy red.; LESKOVA, L.R., red.; ERASOVA, N.V., tekhn. red.

[Modeling of transcendental equations] Modelirovanie transtsendentnykh uravnenii. Leningrad, Sudpromgiz, 1963. 187 p. (MIRA 16:5)
(Mathematical models)

LEBEDEV, A.N., kand. tekhn. nauk, dotsent

Solution of transcendental equations using a root selection method on paper with the aid of mathematical models. Izv. LETI no.47:157-170 '62. (MIRA 16:12)

LEBEDEV, A.N., kand. tekhn. nauk, dotsent

Numerical solution of a system of two transcendental equations using a graphical method. Izv. LETI no.48:311-315 '63.
(MIRA 17:12)

L 25771-66 EWT(m)/T

ACC NR: AP6016381 SOURCE CODE: UR/0048/65/029/010/1935/1937

AUTHOR: Guseva, V. V.; Lebedev, A. M.; Slavatinskiy, S. A.; Sokolovskiy, V. V. 40 38 B

ORG: none

TITLE: Interaction between nucleons and complex nuclei in the presence of high energies 19

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 10, 1965, 1935-1937

TOPIC TAGS: nucleon interaction, compound nucleus, nucleon, pion, Wilson cloud chamber, calorimeter, angular distribution, lithium compound

ABSTRACT: The principal features of the interaction between nucleons and complex nuclei in the presence of accelerating energies are satisfactorily described by the model of the cascade-reproduction of nucleons and pions inside the nucleus. In the presence of energies of hundreds of BeV, however, new, interesting features of this interaction may be expected, since the beam of particles generated in the nucleus is strongly collimated. In this connection, the authors discuss the results of the first attempts to quantitatively examine the cascade process in the presence of high energies, made by BARASHENKOV and YELISEYEV(OIYaN Preprint, R-1678), GUSEVA, et al. (Proc. Intern. Conf. Cosmic Rays, Jaipur, Vol 5, 349, 1963), and LEBEDEV et al. (Zh. Eksperim. i Teor. Fiz.,

2

Card 1/2

L 25771-66

ACC NR: AP6016381

46, 6,2151 (1964)), and compare these theoretical findings with the experimental findings of GUSEVA et al. (Izv. AN SSSR, Ser. Fiz., 26, 549 1962), obtained with field instruments in the Pamir Mts. In the Pamir experiments a thin copper target (5 g·cm^{-2}) was placed in a Wilson chamber and the primary energy from the target was measured by means of an ionization calorimeter. 14 showers with mean energies of 160 bev were thus observed. In another series of experiments 81 showers from a target consisting of lithium hydride (LiH) above a Wilson chamber were observed. It is established that the theoretically calculated parameter of the anisotropy of angular distribution as a function of the Lorentz factor γ_s of the symmetric dispersion of secondary particles is in agreement with the experimental findings if it is calculated on the basis of the cascade model of the interaction, but it diverges from these findings if it is calculated on the basis of the hydrodynamic mode. The authors thank G. B. Zhdanov and M. I. Tret'yakova for providing the materials for the photoemulsion beams which were received and developed in laboratories of various countries. Orig. art. has: 3 figures. [JPRS]

SUB CODE: 20 / SUBM DATE: none / ORIG REF: 005 / OTH REF: 002

Card 2/2

L 45215-66 EWT(1)/T IJP(c) AT

ACC NR: AP6027237 SOURCE CODE: UR/0109/66/011/008/1458/1466

AUTHOR: Lebedev, An. A.; Uvarov, A. I.; Chelnokov, V. Ye.

ORG: none

52
B

TITLE: Transient response of a p-n-p-n junction

SOURCE: Radiotekhnika i elektronika, v. 11, no. 8, 1966, 1458-1466

TOPIC TAGS: pn junction, transient response, transistor, switching transient, transient

ABSTRACT: The transient occuring during switching of a p-n-p-n junction is investigated. Using continuity equations, expressions describing the distribution of concentrations of nonequilibrium carriers in the base regions are obtained. An expression is obtained for the minimum delay time during switching of a four-layer system. It is shown that with the lapse of delay time the increment of current through the sandwich system is described by an exponential law. A comparative analysis is made of the transient response of switching of a p-n-p-n junction and a

Card 1/2

L 45215-66

ACC NR: AP6027237

transistor in a common emitter circuit. The results obtained can be used for evaluating the switching front of controlled rectifiers. [DW]

SUB CODE: 09/ SUBM DATE: 08Mar65/ ORIG REF: 003/ OTH REF: 004/

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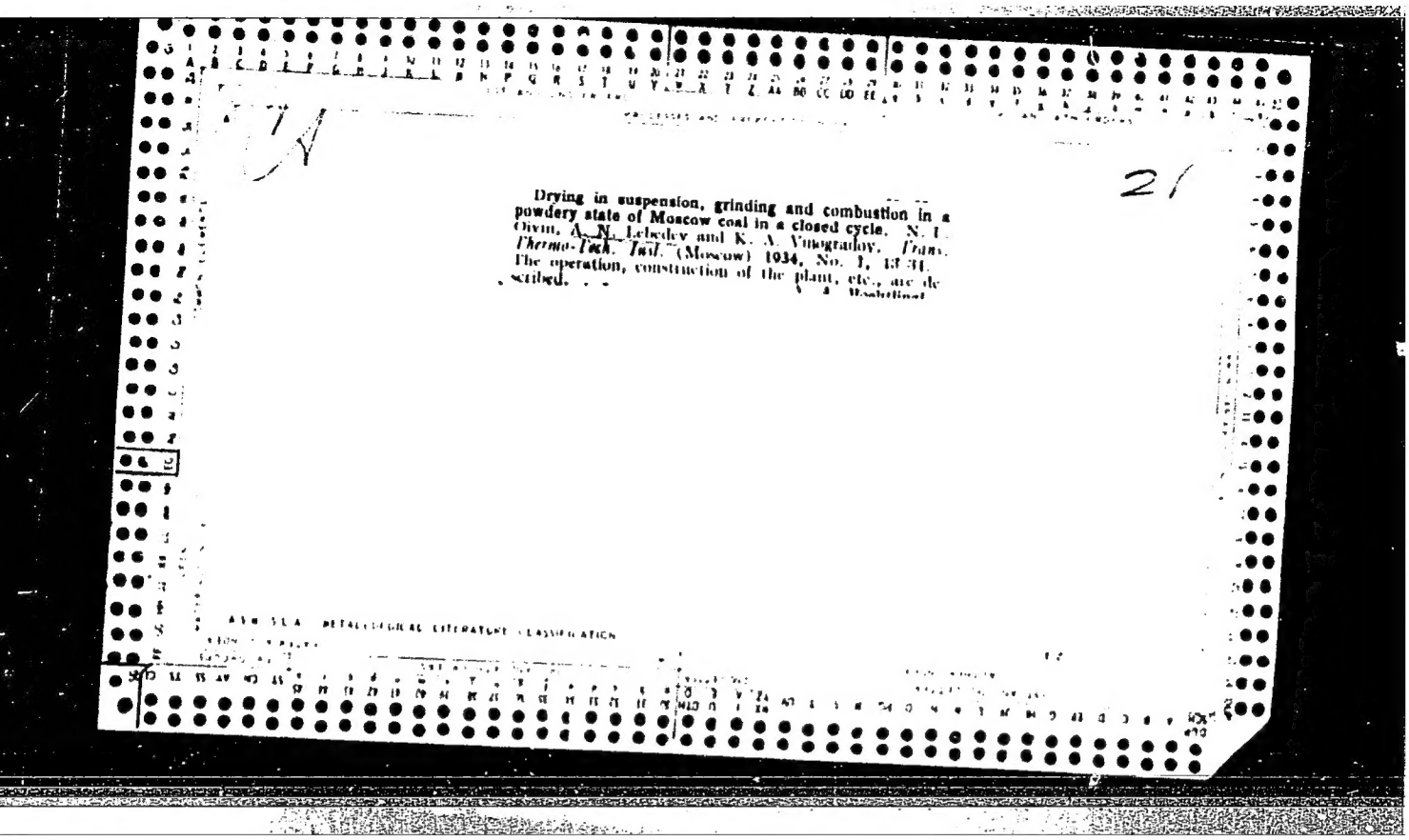

Drying in suspension, grinding and combustion in a powdery state of Moscow coal in a closed cycle. N. I. Orvin, A. N. Lebedev and K. A. Vinogradov. *Trans. Thermo-Tech. Inst.* (Moscow) 1934, No. 1, 17-31. The operation, construction of the plant, etc., are described.